

THE ROLE OF DIETARY COMPOSITION IN THE TREATMENT OF IDDM

P.D. IRELAND, K. O'DEA and A. NANKERVIS

We have previously shown that altering the macronutrient content of the diet can have a profound influence on both carbohydrate and lipid metabolism in normal weight non-insulin dependent diabetics (Ireland et al. 1985; Traianedes et al. 1985). Through a series of four isocaloric weight maintaining diets we demonstrated that metabolic control improved and LDL cholesterol was reduced by reducing fat and increasing fibre. The aim of the present study was to see if insulin-dependent diabetics (IDDM) would respond similarly. Three diets were compared: high carbohydrate, high fibre, low fat (Diet 1); high fat, low carbohydrate (Diet 2); low fat, low carbohydrate, high protein (Diet 3).

Seventeen conventionally treated IDDM subjects (10M, 7F) with a mean age of 29 (21-45) years participated in the study. They were all on a twice daily insulin regimen with a mean dose of 41 (22-56) units/day. The study was conducted on an outpatient basis. A two-week control period where subjects recorded their usual food and beverage consumption and insulin requirements preceded each diet under investigation. The following protocol was observed on the first and last morning of each two-week diet period. Fasting blood samples were taken before the subjects injected their usual morning insulin dose. Fifteen minutes later the zero-time samples were drawn prior to the subjects eating a standard breakfast providing 71g CHO, 17g protein and 13g fat. Further blood samples were taken over the next three hours as for an O.G.G.T. The results are summarized below.

	Daily Insulin Dose(units)	Protein (% en)	CHO (% en)	Dietary Fibre	Fat (% en)	Serum Chol (mmol/l)	HDL Chol (mmol/l)
DIET 1 n=10							
PRE	37	18	46	22	36	6.1	1.5
POST	37	24 ^c	65 ^c	73 ^c	11 ^c	4.7 ^b	1.2 ^c
DIET 2 n=10							
PRE	44	19	41	23	37	6.2	1.7
POST	43	20	26 ^c	17 ^b	53 ^c	6.4 ^a	2.0 ^a
DIET 3 n=8							
PRE	41	19	46	20	33	5.4	1.8
POST	35 ^a	62 ^c	22 ^c	13 ^b	16 ^c	5.4	1.6

Statistical comparisons, PRE vs POST: a p<0.05, b p<0.01, c p<0.001

There was no difference between pre- and post- fasting plasma glucose for any diet but the postprandial glycaemic response to the standard meal was significantly (p<0.05) elevated following two weeks of high fat feeding. Total and HDL cholesterol also rose in response to this diet (Diet 2) and fell after the low fat, high carbohydrate diet (Diet 1). There was no change in any marker of lipid metabolism following the low fat, low carbohydrate diet (Diet 3) but mean daily insulin had to be reduced by 6 units to avoid frequent hypoglycaemic episodes. We conclude that, in contrast to NIDDM, in IDDM major changes in dietary composition had only a minor effect on glycaemic control. Indeed, the only significant improvement on any of the diets was the fall in cholesterol levels on Diet 1.

IRELAND, P.D., NIALL, M., SADLER, S., DELUISE, M., TRAIANEDES, K., and O'DEA, K. (1985). *Proc. Nutr. Soc. Aust.* 10:200.

TRAIANEDES, K., SADLER, S., DELUISE, M., and O'DEA, K. (1985). *Proc. Nutr. Soc. Aust.* 10:112.